

Divide

Polynomial \div Monomial

Step 1: Use the distributive property to write every term of the numerator over the monomial in the denominator.

The divisor (what you are dividing by) goes under every part of the numerator. The dividend is the numerator, and each part of it should have the divisor underneath it.

Step 2: Simplify the fractions.

After you write each term (part) of the top as a fraction with the denominator having the original denominator on the bottom of each piece, you can reduce the fractions. This is done by cancelling common terms in each fraction.

Example: Divide $\frac{5x^5 + 6x^3 - 20}{2x}$

Step 1: Use distributive property to write every term of the numerator over the monomial in the denominator.

$$\frac{5x^5 + 6x^3 - 20}{2x} = \frac{5x^5}{2x} + \frac{6x^3}{2x} - \frac{20}{2x} =$$

AND

Step 2: Simplify the fractions.

$$\frac{\cancel{5x^5}}{\cancel{2x}} + \frac{\cancel{6x^3}}{\cancel{2x}} - \frac{\cancel{20}}{\cancel{2x}} = \frac{5}{2}x^4 + 3x^2 - \frac{10}{x}$$

- Divide EVERY term by 2x

- Simplify each term

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Using Long Division

Step 1: Set up the long division.

The divisor (what you are dividing by) goes on the outside of the box. The dividend (what you are dividing into) goes on the inside of the box.

When you write out the dividend, make sure that you insert 0's for any missing terms. For example, if you had the polynomial $x^4 - 3x + 5$, the first term has an exponent of 4, then the next highest exponent is 1. It is missing the exponents 3 and 2. So if we were to put it inside a division box, we would write it like this:

$$\overline{) x^4 + 0x^3 + 0x^2 - 3x + 5}$$

This will allow you to line up like terms when you go through the problem.

Step 2: Divide 1st term of divisor by first term of dividend to get first term of the quotient.

The quotient (answer) is written above the division box.

Make sure that you line up the first term of the quotient with the term of the dividend that has the same degree.

$$\overline{) x^4 + 0x^3 + 0x^2 - 3x + 5}$$

Step 3: Take the term found in step 1 and multiply it times the divisor.

Make sure that you line up all terms of this step with the term of the dividend that has the same degree.

Step 4: Subtract this from the line above.

Make sure that you subtract EVERY term found in step 3, not just the first one.

Step 5: Repeat until done.

Step 6: Write out the answer.

Your answer is the quotient that you ended up with on the top of the division box.